

## CLAIMS

What is claimed is:

1. A method of managing disc defects occurring on a write once disc that is a single record layer disc in which a lead-in area, a data area, and a lead-out area are sequentially formed and a first spare area and a second spare area are formed at both ends of the data area, respectively, the method comprising:

allocating a first temporary defect management area (TDMA) to at least one of the lead-in area and the lead-out area;

allocating a second TDMA between the first spare area and a user data area or between the user data area and the second spare area; and

performing disc defect management using the first and second TDMA's.

2. The method of claim 1, wherein the performing disc defect management comprises:

updating and recording temporary management information in the second TDMA, whenever a predetermined number of clusters are recorded in the user data area or a verify-after-write method is performed a predetermined number of times; and

updating and recording the temporary management information in the first TDMA in recording operation units.

3. A method of managing disc defects occurring on a write once disc that is a double record layer disc including a first record layer in which a lead-in area, a data area, and an outer area are formed along a recording path and a first spare area and a second spare area are formed at both ends of the data area, respectively; and a second record layer in which an outer area, a data area, and a lead-out area are formed along a recording path and a third spare area and a fourth spare area are formed at the both ends of the data area, the method comprising:

allocating a first temporary defect management area (TDMA) to at least one of the lead-in area, the lead-out area, and the outer area;

allocating a second TDMA between the first spare area and a user data area and/or between the fourth spare area and the user data area; and

performing disc defect management using the first and second TDMA's.

4. The method of claim 3, wherein the performing disc defect management comprises:

updating and recording temporary management information in the second TDMA whenever a predetermined number of clusters are recorded in the user data area or a verify-after-write method is performed a predetermined number of times; and

updating and recording the temporary management information in the first TDMA in recording operation units.

5. A method of managing disc defects occurring on a write once disc, the method comprising:

updating a second temporary defect management area (TDMA) of a data area of the write once disc whenever data is recorded in the data area in a predetermined recording period;

updating a first TDMA formed in at least one of a lead-in area, a lead-out area, and an outer area of the write once disc whenever data is recorded in the data area of the write once disc in another predetermined recording period; and

recording temporary management information, which is most recently updated in the first or second TDMA, in a defect management area (DMA) formed in at least one of the lead-in area, the lead-out area, and the outer area.

6. The method of claim 5, wherein the updating the second TDMA comprises updating and recording temporary management information whenever a predetermined number of clusters are recorded in the data area or a verify-after-write method is performed a predetermined number of times.

7. The method of claim 5, wherein the updating the first TDMA comprises updating and recording temporary management information in recording operation units.

8. The method of claim 5, wherein the updating the second TDMA further comprises:

recording data in predetermined units;

verifying the recorded data to detect a defective portion of the write once disc where a defect occurs;

temporarily storing information pointing to the defective portion and information pointing to a replacement portion for the defective portion in a memory;

reading the information stored in the memory and recording the read information as temporary defect information; and

recording temporary defect management information managing the recorded temporary defect information.

9. A disc drive comprising:

a pickup that records data on and reads data from a write once disc; and

a controller that controls the pickup to allocate a first TDMA to at least one of a lead-in area and a lead-out area of the write once disc, allocate a second TDMA between a first spare area and a user data area or between the user data area and a second spare area, and perform disc defect management on the write once disc using the allocated first and second TDMAs,

wherein the write once disc is a single record layer disc in which the lead-in area, a data area, and the lead-out area are sequentially formed and the first and second spare areas are respectively formed at both ends of the data area.

10. The disc drive of claim 9, wherein the controller controls the pickup to update and record temporary management information in the second TDMA whenever a predetermined number of clusters are recorded in the user data area or a verify-after-write method is performed a predetermined number of times, and controls the pickup to update and record temporary management information in the first TDMA in recording operation units.

11. A disc drive comprising:

a pickup that records data on and reads data from a write once disc; and

a controller that controls the pickup to allocate a first TDMA to at least one of a lead-in area, a lead-out area, and an outer area of the write once disc, allocate a second TDMA between a first spare area and a user data area and/or between a fourth spare area and the user data area, and perform disc defect management on the write once disc using the allocated first and second TDMAs,

wherein the write once disc is a double record layer disc including a first record layer in which the lead-in area, a data area, and the outer area are formed along a recording path, and the first spare area and a second spare area are respectively formed at both ends of the data area; and including a second record layer in which a second outer area, a second data area, and a second lead-out area are formed along a recording path, and a third spare area and the fourth spare area are respectively formed at both ends of the second data area.

12. The disc drive of claim 11, wherein the controller controls the pickup to update and record temporary management information in the second TDMA whenever a predetermined number of clusters are recorded in the user data area or a verify-after-write method is performed a predetermined number of times, and update and record temporary management information in the first TDMA in recording units.

13. A disc drive comprising:  
a pickup that records data on and reads data from a write once disc; and  
a controller that controls the pickup to update a second temporary defect management area (TDMA) formed in a user data area of the write once disc whenever data is recorded in the user data area in a predetermined recording period, update a first TDMA formed in at least one of a lead-in area, a lead-out area, and an outer area of the write once disc whenever data is recorded in the user data area in another predetermined recording period, and record temporary management information, which is recently updated and recorded in the first or second TDMA, in a defect management area (DMA) formed in at least one of the lead-in area, the lead-out area, and the outer area.

14. The disc drive of claim 13, wherein the controller controls the pickup to update the second TDMA by updating and recording temporary management information in the second TDMA whenever a predetermined number of clusters are recorded in the user data area or a verify-after-write method is performed a predetermined number of times.

15. The disc drive of claim 13, wherein the controller controls the pickup to update the first TDMA by updating and recording temporary management information in the first TDMA in recording units.

16. The disc drive of claim 13, further comprising:

a memory,

wherein the controller controls the pickup to record data in the user data area in predetermined units so as to update the second TDMA, verify the recorded data to detect a defective portion of the write once disc where a defect occurs, temporarily store information pointing to the defective portion and information pointing to a replacement portion for the defective portion in the memory, read the information stored in the memory and record the read information as temporary defect information in the second TDMA when the verify-after-write method is performed a predetermined number of times, and further record temporary defect management information for managing the recorded temporary defect information in the second TDMA.

17. A write once disc that is a single record layer disc in which a lead-in area, a data area, and a lead-out area are sequentially formed and a first spare area and a second spare area are sequentially formed in the data area, the write once disc comprising:

a defect management area (DMA) formed in at least one of the lead-in area and the lead-out area;

a first temporary defect management area (TDMA) formed in at least one of the lead-in area and the lead-out area; and

a second TDMA formed between the first spare area and a user data area or between the user data area and the second spare area.

18. The write once disc of claim 17, wherein temporary management information is updated and recorded in the second TDMA whenever a predetermined number of clusters are recorded in the user data area or a verify-after-write method is performed a predetermined number of times.

19. The write once disc of claim 17, wherein temporary management information is updated and recorded in the first TDMA in recording operation units.

20. The write once disc of claim 17, wherein temporary management information, which is most recently recorded in the first or second TDMA, is recorded in the DMA for disc finalization.

21. A write once disc that is a double record layer disc including a first record layer in which a first lead-in area, a first data area, and a first outer area are sequentially formed along a recording path and a first spare area and a second spare area are formed at both ends of the first data area, and including a second record layer in which a second outer area, a second data area, and a second lead-out area are sequentially formed along a recording path and a third spare area and a fourth spare area are respectively formed at both ends of the second data area, the write once disc comprising:

- a DMA formed in at least one of the first and second lead-in area, lead-out area, and outer area;

- a first TDMA formed in at least one of the lead-in area, the lead-out area, and the outer area; and

- a second TDMA formed between the first spare area and a user data area and/or between the fourth spare area and the user data area.

22. The write once disc of claim 21, wherein temporary management information is updated and recorded in the second TDMA whenever a predetermined number of clusters are recorded in the user data area or a verify-after-write method is performed a predetermined number of times.

23. The write once disc of claim 21, wherein temporary management information is updated and recorded in the first TDMA in recording operation units.

24. The write once disc of claim 21, wherein temporary management information, which is most recently updated and recorded in the first or second TDMA, is recorded in the DMA.

25. A method of managing defects in a recording medium, comprising:  
allocating a first temporary defect management area (TDMA) to a first predetermined area on the recording medium;

allocating a second TDMA to a second predetermined area on the recording medium;  
allocating a defect management area (DMA) to the first predetermined area; and  
performing disc defect management using the first TDMA, the second TDMA and the DMA, wherein the second predetermined area is within a data area of the recording medium and is separate from the first predetermined area.

26. The method of claim 25, wherein the recording medium is an optical write once disc.

27. The method of claim 26, wherein the optical write once disc is a single record layer disc.

28. The method of claim 27, wherein the first predetermined area is at least one of a lead-in area and a lead-out area on the optical disc.

29. The method of claim 28, wherein the second predetermined area is a predetermined section of the data area of the disc.

30. The method of claim 28, wherein the data area comprises a first spare area storing defect replacement information, a user data area storing data, and a second spare area storing defect replacement information.

31. The method of claim 30, wherein the second predetermined area is at least one of a section within the data area between the first spare area and the user data area and a section within the data area between the user data area and the second spare area.

32. The method of claim 26, wherein the recording medium comprises a two record layer write once optical disc comprising a first record layer and a second record layer.

33. The method of claim 32, wherein the first predetermined area is at least one of a lead-in area, a lead-out area, a first outer area, and a second outer area of the optical disc.

34. The method of claim 33, wherein the second predetermined area is a predetermined section of the data area of the disc.

35. The method of claim 33, wherein the data area comprises:  
a first spare area storing defect replacement information, a first user data area storing data, and a second spare area storing defect replacement information formed between the lead-in area and a first outer area of the first record layer; and  
a third spare area storing defect replacement information, a second user data area storing data, and a fourth spare area storing defect replacement information formed between a second outer area and the lead-out area of the second record layer.

36. The method of claim 35, wherein the second predetermined area is at least one of a section between the first spare area and the first user data area and a section between the second user data area and the fourth spare area.

37. The method of claim 26, wherein the first TDMA and the second TDMA are allocated so that the write once optical disc is compatible with a rewritable disc drive, and the disc defect management is performed on the write once optical disc using the rewritable disc drive.

38. The method of claim 37, further comprising:  
finalizing the optical disc by recording at least one of the first TDMA and the second TDMA to the DMA based on the TDMA having the most current defect management information.